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REMARKS

Claims 1-40 are all the claims pending in the application. Claims 24-33 are allowed. Claims 14 stands objected to only as being dependent upon a rejected base claim, and would be allowable if rewritten and independent form to include all the limitations of the base claim and any intervening claims. Claim 14 has been rewritten in independent form to place them in condition for immediate allowance.

Claims 1-13, 15-23, and 34-40 stand rejected on prior art grounds. In addition, the drawings are objected to. Applicants respectfully traverse these objections/rejections based on the following discussion.

I.   The Prior Art Rejections

Claims 1-13, 15-23, and 34-40 stand rejected under 35 U.S.C. §102(b) as being unpatentable over Segal (6,053,568). Applicants respectfully traverse this rejection because Segal does not teach or suggest "adding selecting logic to make outputs corresponding to eliminated redundant latches mutually exclusive to outputs corresponding to remaining latches."

Current designs consume a significant portion of their total power in the latches and clock tree. Designers require latches to hold the state of the design from cycle to cycle. While some clock gating has been added to the architecture, the sheer number of latches impact the area and the overall clock tree design. On the other hand, the actual use of particular latches on a cycle by cycle basis is often sparse. In addition, whole cores of latches may be non-overlapping in a time domain. The invention provides an automated approach of determining which latches can be shared across a design. As such, this invention provides a new method of reducing the number of latches within the design without impacting the functionality of the design.

As shown in Applicants' Figure 1B, the selection logic 23 locks non-active output(s) to a known logical state when a corresponding output (e.g., the other output(s) in a pair (or set) of outputs) is active. Essentially, the inverter 24 makes the output corresponding to the two AND devices 25 mutually exclusive. The selection logic has

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more outputs than latches and preferably includes outputs equal in number to the number of latches in the initial physical design to allow the delay device 21 and selection logic 23 to provide a similar output as would have been seen with the non-compressed examples shown in Figure 1A. Further, the inverter 24 combined with AND devices 25 (within the selection logic 23) permit one control signal to control a series of outputs similarly. Therefore, a single control signal could be used to control multiple sets of compressed latches within a hierarchical design. All independent claims define these features where the claims recite "adding selecting logic to make outputs corresponding to eliminated redundant latches mutually exclusive to outputs corresponding to remaining latches."

To the contrary, in Segal a computer program analyzes a digital circuit representation to find all latch paths which connect from input pin to output pin. Then rather than collapsing together single latches (as suggested by the standard pin-to-pin modeling process), similar latch paths are collapsed together. Therefore, Segal is limited to teaching the collapsing of single latches or latch paths and does not teach or suggest "adding selecting logic to make outputs corresponding to eliminated redundant latches mutually exclusive to outputs corresponding to remaining latches" as defined by independent claims 1, 8, 15, 21, and 34. Therefore, these independent claims are not anticipated by Segal. Further, dependent claims 2-7, 9-13, 16-20, 22, 23, and 35-40 are similarly not anticipated not only because they depend from a non-anticipated claim, but also because of the additional features they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

II.   Formal Matters and Conclusion

With respect to the objection to the drawings, replacement formal drawings are submitted herewith. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections to the claims and drawings.
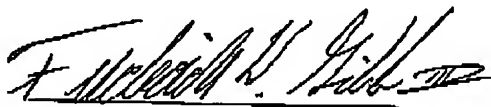
In view of the foregoing, Applicants submit that claims 1-40, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

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Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0456.

Respectfully submitted,

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